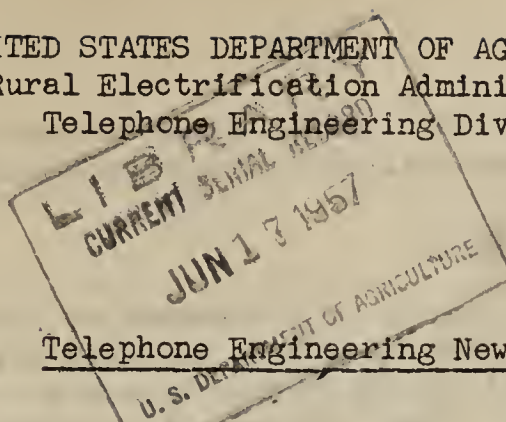


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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Telephone Engineering Division



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Telephone Engineering Newsletter

Newsletters are intended to provide a means of answering questions that arise in the field and to advise the field of new developments. They are not intended to be instructions nor to replace in any respect the presently approved channels for establishing requirements and procedures. Suggestions for news items will be appreciated.

Bureau of Standards Making Line Wire Tests for REA

The Bureau of Standards is to make tests for REA on line wires in 300 foot spans. The tests will include determination of the amplitude and frequency of vibration with and without vibration dampers on several kinds of line wire both insulated and bare.

TE & CM Sections Soon to be Issued

The following lists the TE and CM Sections and Addenda submitted for reproduction since Newsletter No. 12 of May 1956:

New	465	REA-VI Transposition System
Add.	629	Cable Plant Layout
New	902	Trunk and Subscriber Carrier Application Guide
New	221	Assignment of Line and Station Number (TPS)
Rev.	210	Telephone System Design Criteria, Engineering Time Periods
Rev.	615	Design of Open Wire Lines

An addendum to Section 625, "Open Wire Pole Top Assembly Units", was prepared and listed in Newsletter No. 11, March 1956. This was withdrawn and a revision prepared instead. This was desirable in order to make Section 625 agree exactly with the Construction Contract, REA Form 511, issue of March 1956. The revision will be submitted for reproduction very soon.

Tie Wire Lengths

Newsletter No. 12 mentioned that tie wires for the prelashd tie would be 20 inches in length for both steel and copperweld ties and for both Toll Grade and Double Petticoat insulators. This is length enough for use on Double Petticoat insulators but is longer than necessary for the Toll Grade insulators. It has been decided to use 18 inch lengths for both types of insulators. The ends will be too short to bend back as shown on Guide Drawing 163-3 in the Construction Contract, REA Form 511, where used on Double Petticoat insulators but in this case the twisted pigtail can be bent

aside as in Guide Drawing 163. It is not a serious situation since the Double Petticoat insulators will not be used after January 1, 1957.

Change in T-17 Assembly Units

Attention is called to a change in the manner of placing the two T-7 heavy duty tandem brackets when making a T-17 assembly unit for the pole pin circuit where point type transposition brackets are used on circuits other than the pole pin circuit. The transposition system for this arrangement is shown on Guide Drawing 128, dated February 9, 1956, in the Construction Contract, REA Form 511. The drawing of the T-17 assembly unit dated February 11, 1956, in REA Form 511 shows the two T-7 units placed so that the insulators are quite close together. These two revised drawings carry the date of June 12, 1956. In the new drawing of the T-17 unit the bracket for which a bolt hole has to be bored through the crossarm, is reversed so that the two "tongues" of the brackets meet. This places the insulators farther apart and prevents possibility of them touching each other, which was a difficulty reported on the earlier arrangement. The revised drawing of the T-17 unit and Drawing 128 will be included in the revised Section 625 which is nearly ready for printing.

Aluminized Steel Line Wire Under Study by REA

Trial of aluminized steel wire is under consideration on an REA borrower's project in Louisiana where corrosive atmospheric conditions are severe and Grade A galvanized steel is not recommended. The aluminum is applied to steel wire by a hot dip method. The aluminum thickness on .109 inch diameter wire is about the same as the zinc on Grade A galvanized steel wire. REA has requested detailed engineering information about the wire to determine its acceptability for the REA borrower's use. The manufacturer of the wire claims it has lower resistance than the same gauge wire with zinc coating due to the lower resistivity of the aluminum as compared to zinc. Standard zinc coated hardware is said to be satisfactory on this wire.

Buried Wire Trial in Kansas

The Craw-Kan Telephone Cooperative Association, Inc., Kansas 548, is undertaking the direct burial of four types of insulated wire. REA has provided the borrower with wire and the technical information required as to the details of burying, splicing and terminating the wires. For most of the use the wires will be plowed in to a minimum of 16 inches along highways, deeper where necessary at ditches and shallower across driveways, lawns or pasture land. Use of about 2-1/2 miles each of two types of wire and 5 miles each of two other types are contemplated. The first two are unarmored 14 gauge polyethylene insulated copperweld wire and 17 gauge harddrawn copper wire. The longer lengths will be 14 gauge polyethylene covered copperweld wire with a steel armor tape over this with an outer jacket of polyethylene, and the other will be similar but 17 gauge harddrawn copper wire. All splices will be made above ground on a pedestal or pole, the splice being in a wire terminal for protection, with moulding up the pole or pedestal over the wires. Aerial drop wires from poles will be used in general for connections to customers.

Contracts for Development of Radio for Dial Service to Fixed and Mobile Stations

REA has placed developmental contracts with two firms for equipment that will work directly from radio installations into dial offices without the intervention of an operator. Delivery is expected in about six months of a dial-operated small fixed station operating on 110 volts for isolated subscribers, an automatic base station, and two dial-operated mobile units of 30 and 60 watts respectively. The equipment will be installed on REA borrowers' telephone systems and tested by REA engineers for a year or more to determine costs and quality of service. The new developments may prove useful and economical for isolated farms where wire lines cannot be used; for mobile service for farm and commercial use in automobiles, trucks and boats; and for radio-telephone communication between the telephone office and its own mobile units in maintenance and operation. By the use of transistors it may be possible for fixed radio telephones to continue operation in case of power failure by the use of lifetime rechargeable batteries.

Noise Control on Rural Telephone Lines

For half a century noise on telephone lines due to induction from power lines has been a constant source of concern to the industry. By the 1930's the phenomena resulting in such noise had been well explained and methods of coping with it developed.

Farm lines tend to have longer exposures from higher voltages than urban. It was foreseen early in the REA telephone program that this would be a serious problem unless adequate design and construction standards based on the earlier studies, were built into specifications for outside plant, station and central office equipment.

It was appreciated then and as tens of thousands of miles of lines built to a greater or less extent exposed to power line induction has confirmed, that some noise induction problems will develop despite all precautions. Unfortunately, the methods developed by the larger telephone companies for coping with such problems required highly specialized personnel and equipment, not justifiable in operations the size of the average REA borrower. REA therefore looked for something which could give an indication of how to pinpoint causes of noise, at least those causes correctible within the telephone plant, without the necessity for such personnel or equipment.

It was out of such consideration that REA-TE and CM 455 evolved. The section specifies some of its own limitations. Nevertheless, it has been used with success by personnel who have never before attached noise problems. The Repeating Coil Substitution Method for isolating C.O. equipment unbalances has been an effective tool despite the fact that it is used instead of a method which requires about a thousand dollars worth of laboratory equipment plus a lot of specialized knowhow. One precaution: do not attempt to use the Repeating Coil Substitution Method until absolutely satisfied that the state of balance of outside plant plus station equipment is satisfactory. If the line connecting to the C.O. equipment or the repeating coil is not balanced, the test will be inconclusive.

In this connection, there is some evidence that the practice of bridging ringers, at least on a trial basis, on noisy lines seems to have found little application. Experience has shown that even "high" impedance ringers connected for divided ringing can cause enough unbalance to create serious noise problems under some conditions. This effect of ringers may not be noted if other unbalances are present. If bridging ringers is found to help a noisy line and bridged ringing is therefore considered on a permanent basis for a particular line, the result will be that two parties hear each others' coded ring (semi-selective ringing). While this would appear to be a service compromise, it has been found that customers are usually quite understanding when they can hear and be heard more clearly in their telephones.

Telephone Sales Aid

A telecast news release, RURAL TELEPHONES, recently was sent from the Television Service of the U. S. Department of Agriculture to a list of 150 TV farm directors, county agents and others conducting programs of special interest to farm families.

This is a short feature, a "package" of six photographs and an explanatory script, showing some of the benefits that REA telephone loans are bringing to rural subscribers. The pictures and script also suggest the convenience of locating extension phones in the milk house and the poultry house, as well as in the farm kitchen.

No specific time is suggested for carrying this feature, so it can be used at the discretion of the telecaster or the station. REA telephone borrowers may be interested in asking local TV stations about the possibility of tying in local promotion of subscriber sign-up or extension telephones with showing of the USDA packet on RURAL TELEPHONES.

A brief interview with Assistant Administrator J. K. O'Shaughnessy was a feature of THE AMERICAN FARMER, the ABC network farm program, on Saturday, August 25. The subject concerned the proposed development and testing of the radio for dial service discussed above. A tape-recording of this interview, running just under two minutes, has been offered by USDA to radio farm directors throughout the U. S. It can be ordered by any radio station by sending directly to USDA's Radio and Television Service, Office of Information, enough blank tape for dubbing. The catalogue number of this interview is 16 Q 86.